

SIMATIC FS600 laser scanner

Standard laser scanner

Overview

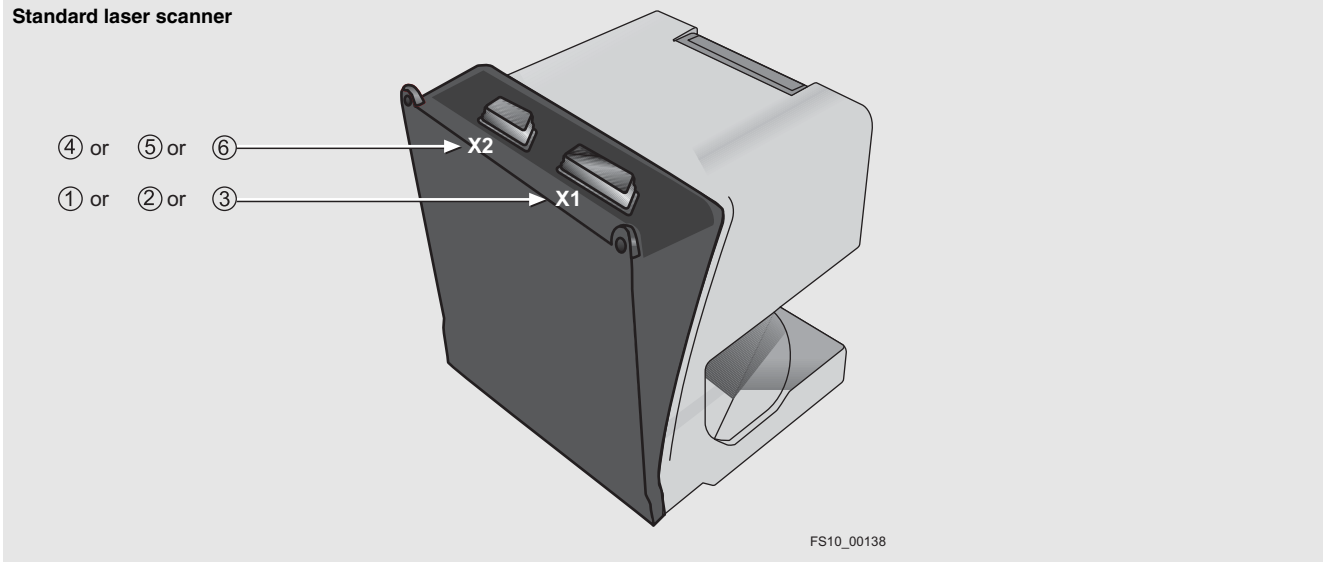


Standard laser scanner with port covers

3

Integration

Standard laser scanner



FS10_00138

Contact assignment

Connection	Description	Position	Connectable accessories	Order No.
X1	15-pin Sub-D connector for control interface	①	Socket, complete, 15-pin	3RG78 38-1BA
		②	Socket, complete, 15-pin with side cable entry	3RG78 38-1BB
		③	Connecting cable, incl. socket, 15-pin	3RG78 38-1BD (5 m)
				3RG78 38-1BE (10 m)
X2	9-pin Sub-D connector for RS232/RS422 PC interface	④	Plug, complete, 9-pin	3RG78 38-1BF (20 m)
				3RG78 38-1BG (35 m)
		⑤	Plug, complete, 9-pin with side cable entry	3RG78 38-1BH (50 m)
				3RG78 38-1CA
		⑥	Connecting cable, incl. plug, 9-pin	3RG78 38-1CB
				3RG78 38-1CC (3 m)
				3RG78 38-1CD (5 m)
				3RG78 38-1CE (10 m)

Technical specifications

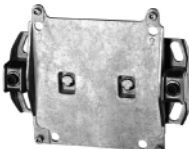
Type	Standard laser scanner
Personnel protective field	
Detection range	0 ... 4 m
Luminance factor	min. 1.8 %
Object size/diameter	70 mm (cylindrical test body)
Response time	
• Dual evaluation (2 scans)	80 ms
• Adjustable up to 16 scans	640 ms
No. of protective fields	4 (can be selected via switching inputs)
Output	2 fail-safe pnp transistor outputs (24 V, 250 mA)
Safety category	
• To DIN V 19250	Requirements class 4
• To EN 954-1	Category 3 (single-fault-proof)
• To IEC 61496-1, EN 61496-3	Type 3
Start	Start-up testing and start-up inhibit can be set separately.
restart	160 ms to 10 s adjustable or manual
Supplement with deactivated dust suppression	83 mm
Supplement with activated dust suppression	
• Protective field size < 3.5 m	83 mm
• Protective field size > 3.5 m	100 mm
Additional supplement in the case of existing retro-reflectors or highly reflective surfaces (e.g. certain metals or ceramics) in the scan plane	
• More than 1.2 m behind the protective field line	0 mm
• In protective field or up to 1.2 m behind the protective field line	110 mm
Warning field	
Detection range	0 ... 15 m
Luminance factor	min. 20 %
Object size	150 mm × 150 mm
Response time	
• Dual evaluation (2 scans)	80 ms
• Adjustable up to 16 scans	640 ms
No. of warning fields	4 (can be selected via switching inputs)
Output	pnp transistor output (max. 100 mA)
Contour measurement	
Detection range	0 ... 50 m
Luminance factor	min. 20 %
Object size	–
Output	RS 232 serial interface (10 m), RS 422 (50 m)
Radial resolution	5 mm
Lateral resolution	0.36°

Type	Standard laser scanner
Power supply	
Operating voltage	Supply (to IEC 60742) with safety isolating transformer or similar for DC/DC transducers
• External supply	24 V DC, –30 ... +20 %*
Current consumption	Approx. 300 mA (use power pack with 2.5 A)
Power consumption with 24 V	8 W plus output load
Overcurrent protection	Via 1.25 A fuse, medium time lag, in control cabinet
Overvoltage protection	With safe final shutdown
Voltage dips	To EN 61496-1
Protective conductor	Must not be connected
Inputs	
Restart/reset	Connection of a command unit for operating mode with restart inhibit and/or device reset, dynamically monitored, 24 V DC optically decoupled
Field pair changeover	Selection from 4 field pairs via 4 control leads with internal monitoring (1 field pair = 1 protective field and 1 warning field), 24 V DC optically decoupled
Signal definition	
• High (logical 1)	16 ... 30 V
• Low (logical 0)	< 3 V
Parameter assignment	
Operating software	Communication and parameterization software under Windows 95/98/NT/2000/XP with safe programming protocol
Interfaces	
For device parameterization field definition	RS232, RS422
Outputs	
Protective field	2 × safe semiconductor output, pnp, max. 250 mA short-circuit monitored, overcurrent protected
Warning field/pollution/fault	pnp transistor output (max. 100 mA)
Load characteristics, max. values	Low-pass response
• Limit frequency f_g	< 1 kHz
• Capacitance C_{load}	< 100 nF
Level	
• High (OSSD)	$U_b - 3.2 V$
• Low (OSSD)	< 2 V
• High (alarm active)	$U_b - 4 V$
• Low (alarm inactive)	< 2 V

Standard laser scanner

Type	Standard laser scanner
Environment and materials	
Degree of protection to IEC 60529	IP65
Touch protection	Total insulation, safety class 2
Ambient temperature	
• Operation	0 ... +50 °C
• Storage	–20 ... +60 °C
Humidity to DIN 40040	Table 10, code E (fairly dry)
Enclosure material	Cast aluminum, plastic
Weight	Approx. 2 kg
Dimensions (W × H × D) in mm	140 × 155 × 135
Distance from center of scan plane to lower edge of enclosure	48.75 mm
Distance from rear edge of enclosure to rotating mirror axis	68 mm
Vibratory load over 3 axes to IEC 60068, part 2-6	10 ... 150 Hz, max. 5 g
Continuous shock over 3 axes to IEC 60068, part 2-29	10 g, 16 ms
Noise Immunity	
• To EN 61496-1	In accordance with requirements for type 4
• Also to DIN 40839-1, -3	Test pulses 1, 2, 3a, 3b, 5 (do not use in vehicles with internal-combustion engines)
Rotating mirror drive	Brushless DC motor
Rotating mirror bearing	Maintenance-free ball bearing
Ports	
Ports	2 connectors (plugged in from above, soldered connection)
Cable Lengths	
• Control cable X1	Max. 50 m (for conductor cross-section of 0.5 mm ² , shielded)
• Data cable X2, RS 232	Max. 10 m
• Data cable X2, RS 422	Max. 50 m (twisted pair)
Optical characteristics	
Rotation angle	Max. 190°
Angle resolution	0.36°
Lateral tolerance	
• Without assembly system (for rear of enclosure)	± 0.18°
• With assembly system (for mounting surface)	± 0.22°
Scan rate	25 scans/s or 40 ms/scan
Laser protection class to EN 60825-1	Class 1 (eye safe)
• Wave length	905 nm (infrared)
• Beam divergence	2 mrad
• Time Base	100 s

Selection and Ordering Data

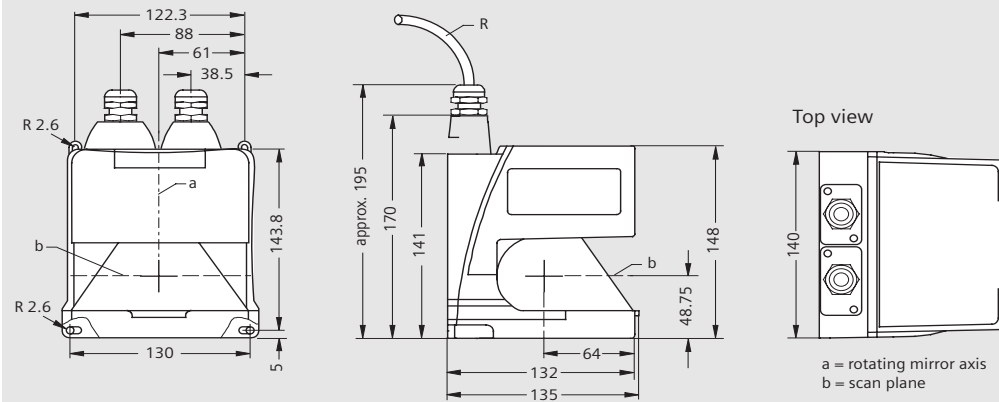
	Order No.
SIMATIC FS620I standard laser scanner Including LS4soft software for securing danger zones	3RG78 34-6DD00
SIMATIC FS660I standard laser scanner with vertical security Including LS4soft software for securing danger zones, danger points and access protection	A 3RG78 34-6DE00
	
Accessories	
Assembly system, hinged, for easy adjustment 	3RG78 38-1AA
Adapter plate for PLS support	3RG78 38-1AB
Cleaning set Includes cleaning fluid (1000 ml), cloths (100 units)	3RG78 38-7RS
Connectors and cables	
• Socket, complete, 15-polig (X1)	3RG78 38-1BA
• Connector, complete, 9-pin (X2)	3RG78 38-1CA
• Socket, complete, 15-polig (X1) With lateral cable routing	3RG78 38-1BB
• Connector, complete, 9-pin (X2) With lateral cable routing	3RG78 38-1CB
Connecting cable	
incl. socket, 15 pins (X1)	
• 5 m	3RG78 38-1BD
• 10 m	3RG78 38-1BE
• 20 m	3RG78 38-1BF
• 35 m	3RG78 38-1BG
• 50 m	3RG78 38-1BH
Connecting cable	
incl. connector, 9-pin (X2)	
• 3 m	3RG78 38-1CC
• 5 m	3RG78 38-1CD
• 10 m	3RG78 38-1CE

For suitable processing units, see "SIGUARD light curtains and arrays".

A: Subject to export regulations: AL = N and ECCN = EAR99H

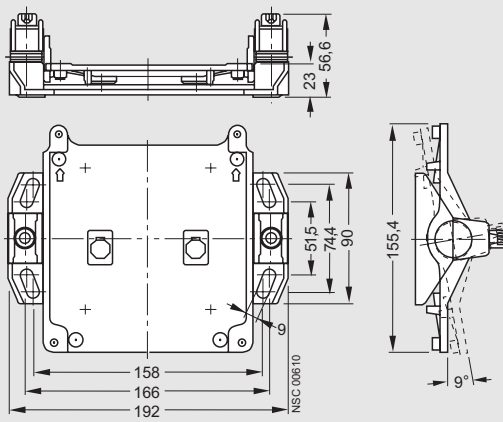
Dimensional drawings

Standard laser scanner with switching output



R = smallest bending radius: 50 mm (original accessories)
a = rotating mirror axis
b = scan level

Assembly system 3RG78 38-1AA



SIMATIC FS600 laser scanner

ASIsafe laser scanner

Overview

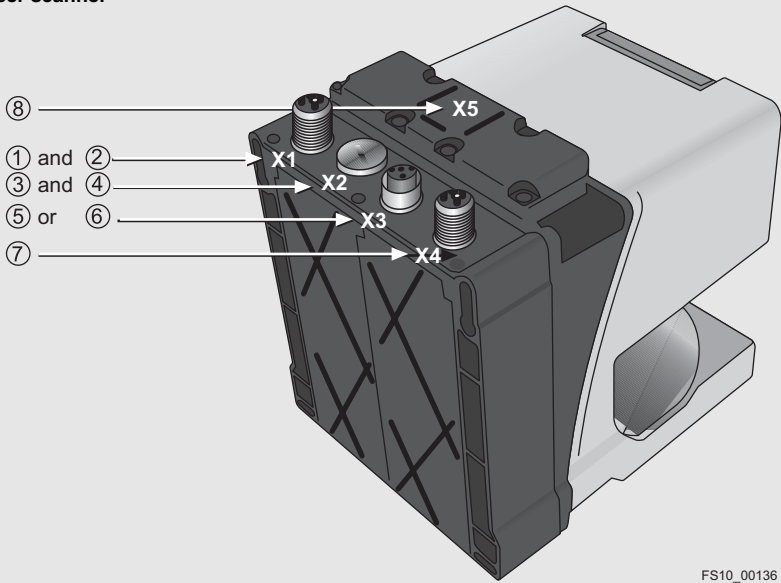


ASIsafe laser scanner

3

Integration

ASIsafe laser scanner



FS10_00136

Contact assignment

Terminal	Description	Item	Connectable accessories	Order No.
X1	M12 connector for AS-Interface connection (bus connection and 24 V DC power supply)	①	Laser scanner connecting cable to M12 AS-Interface adapter	3RG78 38-1EA (1 m) 3RG78 38-1EB (2 m)
		②	M12 AS-Interface adapter	3RG78 38-1DG
X2	Connection for AS-Interface addressing and diagnostics unit	③	AS-Interface addressing and diagnostics unit	3RK1 904-2AB01
		④	Connecting cable with M12 socket and M12 plug (3-core)	3RX8 000-0GF32-1AB5 (1.5 m)
X3	M12 socket for connecting the changeover for the protective fields	⑤	M12 jumper plug (suitable for protection field 1)	3RG78 38-1DF
		⑥	M12 connector with terminal housing, 5-pin	3RX8 000-0CD55
X4	M12 connector for connecting a restart button (optional)	⑦	M12 cable socket with terminal housing, 5-pin	3RX8 000-0CB55
X5	Optical PC interface	⑧	PC connecting cable for laser scanner with optical interface, 9-pin	3RG78 38-1DC

Technical specifications

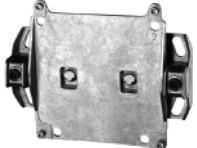
Type	ASIsafe laser scanner
Protective field	
Detection range	0 ... 4 m
Luminance factor	min. 1.8 %
Object size and diameter	70 mm (cylindrical test body)
• Response time	
- dual evaluation (2 scans)	85 ms (laser scanner only, without AS-Interface system times)
- adjustable up to 16 scans	645 ms (laser scanner only, without AS-Interface system times)
Number	4 (selectable via switching inputs)
Safety category	Category 3 to EN 954-1, type 3 to IEC 61496-1 or EN 61496-3
Output	Secure AS-Interface interface
Start	Start test and start inhibit can be set separately
restart	160 ms to 10 s (can be set or is manual)
Protective field supplement	
• For deactivated dust suppression	83 mm
• For activated dust suppression	
- protective field size < 3.5 mm	83 mm
- protective field size > 3.5 mm	100 mm
• Additional supplement in the case of existing retro-reflectors or highly reflective surfaces (e.g. certain metals or ceramics) in the scan plane	
- more than 1.2 m behind the protective field line	0 mm
- in protective field or up to 1.2 m behind the protective field line	110 mm
Warning field	
Detection range	0 ... 15 m
Luminance factor	min. 20%
Object size	150 × 150 mm
Response time	
• dual evaluation (2 scans)	85 ms (laser scanner only, without AS-Interface system times)
• adjustable up to 16 scans	645 ms (laser scanner only, without AS-Interface system times)
No. of warning fields	4 (selectable via switching inputs)
Output	AS Interface
Contour measurement	
Detection range	0 ... 50 m
Luminance factor	min. 20%
Output	RS 232 serial interface via infrared interface
Radial resolution	5 mm
Lateral resolution	0.36 °
Supply voltage	
• Via AS-Interface network	29.5 ... 31.6 V (to AS-Interface specification)
• Via external supply	DC 24 V (± 20 %)

Type	ASIsafe laser scanner
• Note	The power pack for the external power supply and the AS-Interface power pack for supplying the AS-Interface components must have a safe isolation to IEC 60742 and must bridge brief power failures of up to 20 ms (e.g. AS-Interface power pack 3RX9 307-0AA00).
Overcurrent protection	Fuse 1.25 A (medium slow)
Typical current consumption from supply circuit	400 mA
Typical current consumption from AS-Interface circuit	50 mA
Inputs	
Restart/reset	Connection of a command unit for operating mode with restart inhibit and/or device reset, dynamically monitored, 24 V DC optically decoupled
Field pair changeover	Selection from four field pairs via 4 control leads with internal monitoring (1 field pair = 1 protective field and 1 warning field), 24 V optically decoupled
Signal definition	
• High (logical 1)	16 ... 30 V
• Low (logical 0)	< 3 V
Control cable	
• Length	Max. 50 m (cable cross-section: 0.5 mm ² , shielded)
AS-Interface address programming	Connection of a standard AS-Interface address programming device
RS232 interfaces via infrared interface	For device parameterization and field definition
Optics	
Rotation angle	190 °
Angle resolution	0.36 °
Lateral tolerance	
• without assembly system (for rear of enclosure)	± 0.18 °
• with assembly system (for mounting surface)	± 0.22 °
Scan rate	25 scans/s or 40 ms/scan
Laser protection class	
• to standard	EN 60825-1, class 1 (eye safe)
wave length	905 nm
beam divergence	2 mrad
Time Base	100 s

ASIsafe laser scanner

Type	ASIsafe laser scanner
Environment and materials	
Degree of protection	IP65
Ambient temperature	
• Operation	0 ... +50 °C
• Storage	-20 ... +60 °C
Enclosure insulation class	Protection class 2
Humidity	To DIN 40040, table 10, code E (fairly dry)
Dimensions (W × H × D) in mm	141 × 167 × 168
Weight	2.25 kg
Emitter	Infrared laser diode (λ = 905 nm)
Casing	Cast aluminum, plastic, steel connection plate
Vibratory load over 3 axes to IEC 60068, part 2-6	10 ... 150 Hz, max. 5 g
Continuous shock over 3 axes to IEC 60068, part 2-29	10 g, 16 ms
Rotating mirror drive	Brushless DC motor
Rotating mirror bearing	Maintenance-free ball bearing
AS Interface	
• ID code	B
• I/O code	0 (four data bits as outputs)
• Slave address	Programmed by user in the range 1 ... 31 (on delivery = 0)
• Cycle time in accordance with AS-Interface specification	5 ms
• Profile	Reliable slave

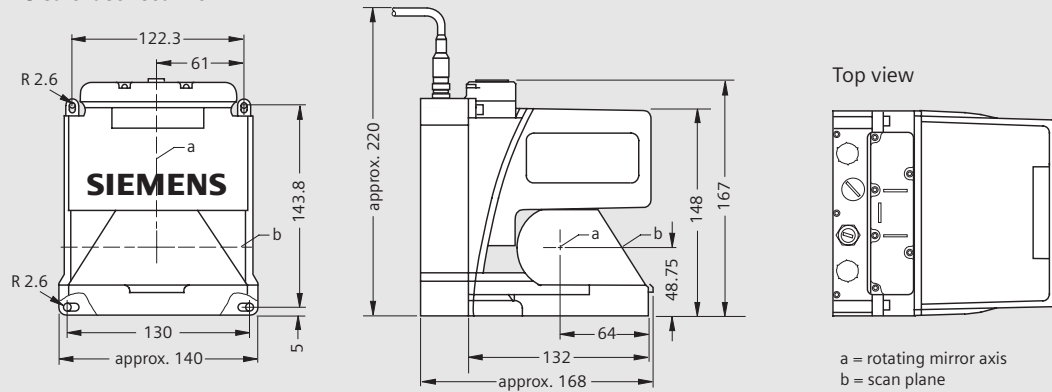
Selection and Ordering Data

	Order No.
SIMATIC FS620I ASIsafe laser scanner Including LS4soft software for securing danger zones	3SF78 34-6DD00
SIMATIC FS660I ASIsafe laser scanner with vertical security Including LS4soft software for securing danger zones, danger points and access protection	A 3SF78 34-6DE00
	
Accessories	
Assembly system, hinged, for easy adjustment	3RG78 38-1AA
	
Adapter plate for PLS mounting support	3RG78 38-1AB
Cleaning set Includes cleaning fluid (1000 ml), cloths (x 100)	3RG78 38-7RS
Connectors and cables	
PC connection cable for AS-Interface and PROFIBUS laser scanner Includes plug (9-pin) and optical interface	3RG78 38-1DC
M12 jumper plug (suitable for protection field 1)	3RG78 38-1DF
M12 adapter For AS-Interface and power supply	3RG78 38-1DG
M12 laser scanner – M12 adapter connection cable • 5-pin, 1 m • 5-pin, 2 m	3RG78 38-1EA 3RG78 38-1EB

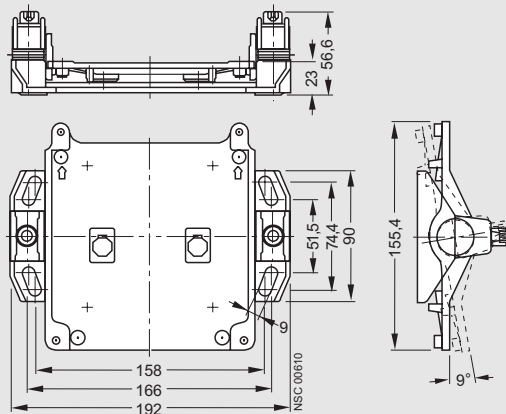
A: Subject to export regulations: AL = N and ECCN = EAR99H

Dimensional drawings

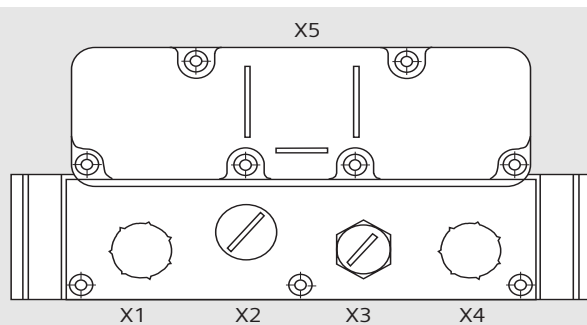
ASIsafe laser scanner



Assembly system 3RG78 38-1AA



Schematics

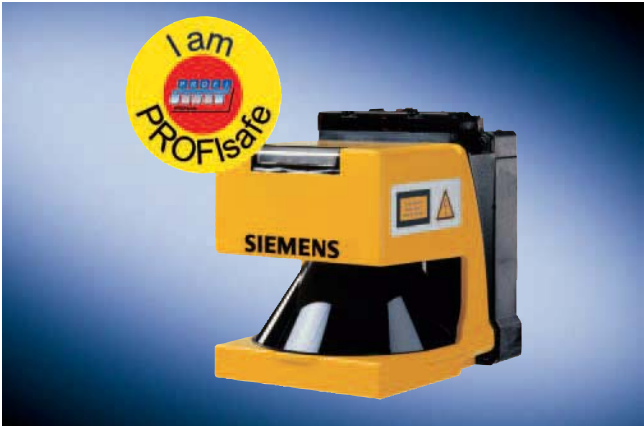


- X1 AS-Interface connection (Bus connection and 24 Volt power supply)
- X2 AS-Interface connection for address programming device
- X3 Connection protective fields switchover
- X4 Connection restart button
- X5 Optical PC Interface

SIMATIC FS600 laser scanner

PROFIsafe laser scanner

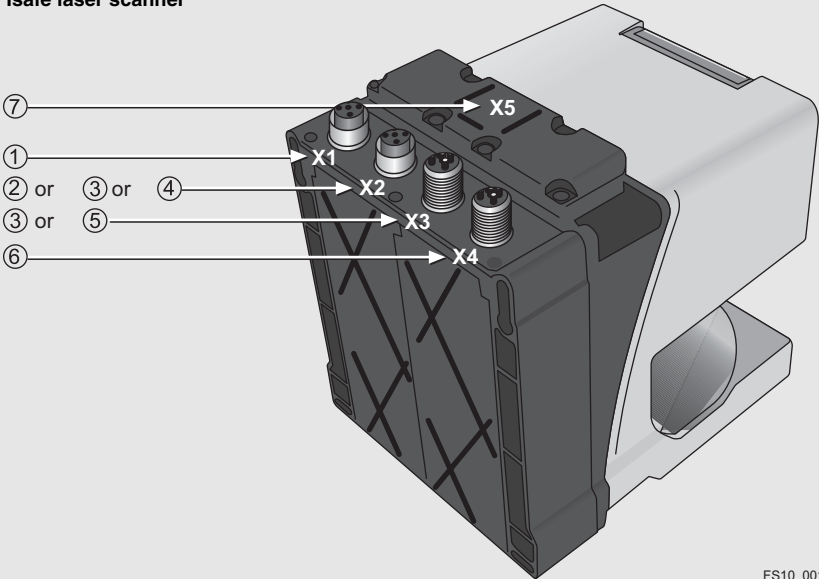
Overview



PROFIsafe laser scanner

Integration

PROFIsafe laser scanner



FS10_00137

Contact assignment

Terminal	Description	Item	Connectable accessories	Order No.
X1	M12 connector for connecting a restart button (optional)	①	M12 connector with terminal housing, 5-pin	3RX8 000-0CD55
X2	M12 socket for PROFIBUS output cable	②	Terminating resistor for PROFIBUS DP	6GK1 905-0EC00
		③	PROFIBUS M12 connecting cable, with plug and socket, 2-pin	6XV1 830-3DE50 (0.5 m) 6XV1 830-3DH15 (1.5 m) 6XV1 830-3DH30 (3.0 m) 6XV1 830-3DH50 (5.0 m) 6XV1 830-3DN10 (10.0 m) 6XV1 830-3DN15 (15.0 m)
		④	PROFIBUS M12 connecting plug with male insert	6GK1 905-0EA00
X3	M12 plug for PROFIBUS input cable	③	PROFIBUS M12 connecting cable, with plug and socket, 2-pin	6XV1 830-3DE50 (0.5 m) 6XV1 830-3DH15 (1.5 m) 6XV1 830-3DH30 (3.0 m) 6XV1 830-3DH50 (5.0 m) 6XV1 830-3DN10 (10.0 m) 6XV1 830-3DN15 (15.0 m)
		⑤	PROFIBUS M12 connecting plug with female insert	6GK1 905-0EB00
X4	M12 plug for 24 V DC power supply	⑥	M12 cable socket with terminal housing, 5-pin	3RX8 000-0CB55
X5	Optical PC interface	⑦	PC connecting cable for laser scanner with optical interface, 9-pin	3RG78 38-1DC

Technical specifications

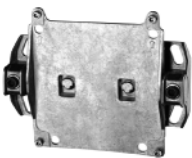
Type	PROFIsafe laser scanner
Protective field	
Detection range	0 ... 4 m
Luminance factor	min. 1.8 %
Object size and diameter	70 mm (cylindrical test body)
Response time	
• dual evaluation (2 scans)	80 ms (only laser scanner without PROFIBUS system times)
• adjustable up to 16 scans	640 ms (only laser scanner without PROFIBUS system times)
Number	4 (can be switched via PROFIBUS)
Safety category	Category 3 to EN 954-1, type 3 to IEC 61496-1 or EN 61496-3
Output	PROFIBUS (PROFIsafe profile)
Start	Start test and start inhibit can be set separately
Restart	160 ms to 10 s (can be set or is manual)
Protective field supplement	
• For deactivated dust suppression	83 mm
• For activated dust suppression	
- protective field size < 3.5 mm	83 mm
- protective field size > 3.5 mm	100 mm
• Additional supplement in the case of existing retro-reflectors or highly reflective surfaces (e.g. certain metals or ceramics) in the scan plane	
- more than 1.2 m behind the protective field line	0 mm
- in protective field or up to 1.2 m behind the protective field line	110 mm
Warning field	
Detection range	0 ... 15 m
Luminance factor	min. 20 %
Object size	150 × 150 mm
Response time	
• dual evaluation (2 scans)	80 ms (only laser scanner without PROFIBUS system times)
• adjustable up to 16 scans	640 ms (only laser scanner without PROFIBUS system times)
No. of warning fields	4 (can be switched via PROFIBUS)
Output	PROFIBUS

Type	PROFIsafe laser scanner
Contour measurement	
Detection range	0 ... 50 m
Luminance factor	min. 20 %
Output	RS 232 serial interface via infrared interface
Radial resolution	5 mm
Lateral resolution	0.36 °
Supply voltage	
• Via external supply	24 V DC (+20 % / -30 %)
• Note	The power pack for the external power supply must have a safe line separation to IEC 60742 and must bridge brief power failures of up to 20 ms.
Overcurrent protection	Fuse 1.25 A (medium slow)
Current consumption	350 mA typical
Inputs	
Restart/reset	Connection of a command device for "with restart inhibit" mode and/or device resets, monitored dynamically
Signal definition	
• High (logical 1)	16 ... 30 V
• Low (logical 0)	< 3 V
Control cable	
• Length	Max. 50 m (cable cross-section: 0.5 mm ² , shielded)
Field pair changeover	Field pair switchover via PROFIBUS (PROFIsafe profile)
RS232 interfaces via infrared interface	For device parameterization and field definition
Optics	
Rotation angle	190 °
Angle resolution	0.36 °
Lateral tolerance	
• without assembly system (for rear of enclosure)	± 0.18 °
• with assembly system (for mounting surface)	± 0.22 °
Scan rate	25 scans/s or 40 ms/scan
Laser protection class	
• to standard	EN 60825-1, class 1 (eye safe)
wave length	905 nm
beam divergence	2 mrad
Time Base	100 s

PROFIsafe laser scanner

Type	PROFIsafe laser scanner
Environment and materials	
Degree of protection	IP65
Ambient temperature	
• Operation	0 ... +50 °C
• Storage	-20 ... +60 °C
Enclosure insulation class	Protection class 2
Humidity	To DIN 40040, table 10, code E (fairly dry)
Dimensions (W × H × D) in mm	141 × 167 × 168
Emitter	Infrared laser diode (λ = 905 nm)
Casing	Cast aluminum, plastic, steel connection plate
Vibratory load over 3 axes to IEC 60068, part 2-6	10 ... 150 Hz, max. 5 g
Continuous shock over 3 axes to IEC 60068, part 2-29	10 g, 16 ms
Rotating mirror drive	Brushless DC motor
Rotating mirror bearing	Maintenance-free ball bearing

Selection and Ordering Data

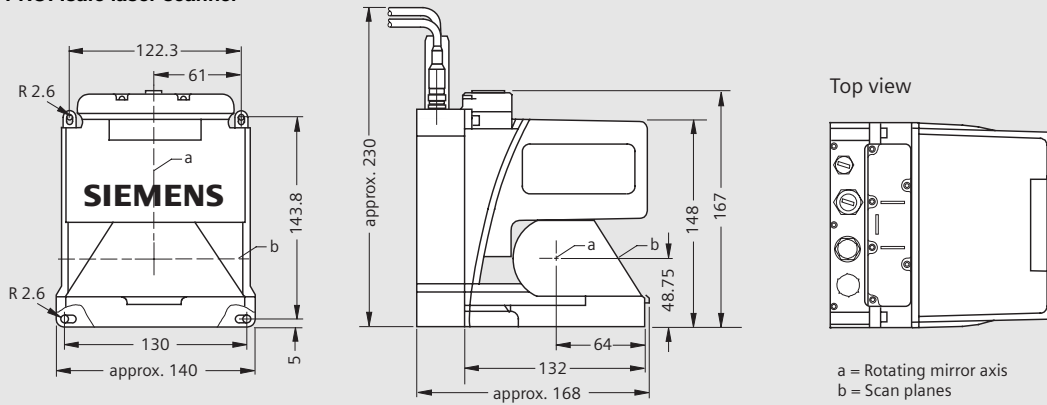
	Order No.
SIMATIC FS620I PROFIsafe laser scanner	3SF78 34-6PB00
Including LS4soft software for securing danger zones	
SIMATIC FS660I PROFIsafe laser scanner with vertical security	A 3SF78 34-6PE00
Including LS4soft software for securing danger zones, danger points and access protection	
	
Accessories	
Assembly system, hinged, for easy adjustment	3RG78 38-1AA
	
Adapter plate for PLS mounting support	3RG78 38-1AB
Cleaning set	3RG78 38-7RS
Includes cleaning fluid (1000 ml), cloths (x 100)	

	Order No.
Connectors and cables	
PC connection cable for AS-Interface and PROFIBUS laser scanners	3RG78 38-1DC
including plug (9-pin), and optical interface	
PROFIBUS M12 terminating connector	6GK1 905-0EC00
For PROFIBUS DP 1 packet = 5 items	
PROFIBUS M12 connectors	
1 pack = 5 units	
• Male pins	6GK1 905-0EA00
• Socket insert	6GK1 905-0EB00
PROFIBUS M12 plug-in cables	
2-core (inverted coding) preassembled, with M12 connectors, in different lengths:	
0.5 m	6XV1 830-3DE50
1.5 m	6XV1 830-3DH15
3.0 m	6XV1 830-3DH30
5.0 m	6XV1 830-3DH50
10.0 m	6XV1 830-3DN10
15.0 m	6XV1 830-3DN15

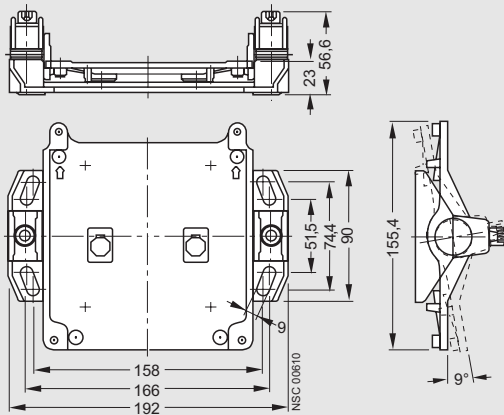
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Dimensional drawings

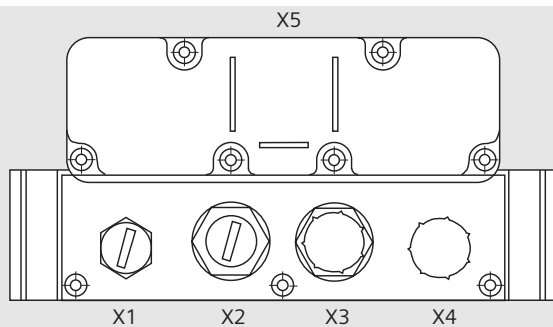
PROFIsafe laser scanner



Assembly system 3RG78 38-1AA



Schematics



- X1 Connection restart button
- X2 PROFIBUS output wire link
- X3 PROFIBUS input wire link
- X4 Connection supply voltage
- X5 Optical PC Interface